

Application No. 09/605,085

Response to Office Action of August 26, 2004

**AMENDMENTS TO THE CLAIMS:**

1. (Currently Amended) A method of maintaining a terrestrial cell site handoff list for an airborne cellular system comprising the steps of:

maintaining a fixed beam pattern of one or more communications beams transmitted from an airplane relative to terrestrial cellular system users, each of the one or more communication beams supporting cellular communications for terrestrial cellular system users, all of the one or more beams covering a footprint on the ground;

determining a location and heading of the airplane;

determining locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data;

determining locations of respective terrestrial cell sites within a vicinity of the footprints of each of the one or more beams transmitted from the airplane; and

calculating a list of viable handoff terrestrial cell site candidates for handoffs of a terrestrial mobile user between one or more communication beams and terrestrial cell sites based on maintaining a fixed communication beam pattern, the location and heading of the airplane, the locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data, and the locations of respective cell sites; and

wherein the step of calculating a list of viable handoff terrestrial cell site candidates comprises mapping data generated from the steps of maintaining a fixed communication beam pattern, determining a location and heading of the airplane, determining locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data, and determining locations of respective cell sites to a cell site location database to determine the viable handoff terrestrial cell site candidates.

2. (Previously Presented) The method of claim 1, wherein the determining of a location and heading of the airplane comprises receiving a flight pattern location of the airplane via a telemetry link.

3. (Cancelled)

Application No. 09/605,085

Response to Office Action of August 26, 2004

4. (Original) The method of claim 1, further comprising ranking each of the viable handoff terrestrial cell site candidates based on associated probability data found during the calculating of a list of viable handoff terrestrial cell site candidates.

5. (Original) The method of claim 4, wherein a number of the viable handoff terrestrial cell site candidates found during the calculating of a list of viable handoff terrestrial cell site candidates is protocol-dependent.

6. (Previously Presented) The method of claim 1, wherein the calculating of a list of viable handoff terrestrial cell site candidates for handoffs of a terrestrial mobile user between one or more communication beams and terrestrial cell sites is performed for each of the one or more communication beams transmitted from the airplane.

7. (Previously Presented) The method of claim 6, further comprising dividing up the list of viable handoff terrestrial cell site candidates into multiple candidate groups according to candidate geographic locations within each of the one or more communication beams transmitted from the airplane; and

cycling through the multiple candidate groups to further reduce the list of viable handoff terrestrial candidates based on the multiple candidate groups.

8. (Cancelled)

9. (Original) The method of claim 1, further comprising updating the list of viable handoff terrestrial cell site candidates as a function of time as the airplane flight pattern data changes.

10. (Original) The method of claim 1, wherein the calculating of a list of viable handoff terrestrial cell site candidates is performed to compensate for airplane flight pattern changes caused by adverse weather conditions.

11. (Original) The method of claim 1, further comprising calculating viable airplane beams for receiving handoffs from terrestrial cell sites; and

Application No. 09/605,085  
Response to Office Action of August 26, 2004

creating an airplane beam handoff list based on the calculating of viable airplane beams.

12. (Original) The method of claim 1, further comprising dividing the list of viable handoff terrestrial cell site candidates into time-sensitive candidates and non-time-sensitive handoff candidates.

13. - 22. (Cancelled)

23. (New) A method of maintaining a terrestrial cell site handoff list for an airborne cellular system comprising the steps of:

maintaining a fixed beam pattern of one or more communications beams transmitted from an airplane relative to terrestrial cellular system users, each of the one or more communication beams supporting cellular communications for terrestrial cellular system users, all of the one or more beams covering a footprint on the ground;

determining a location and heading of the airplane;

determining locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data;

determining locations of respective terrestrial cell sites within a vicinity of the footprints of each of the one or more beams transmitted from the airplane;

calculating a list of viable handoff terrestrial cell site candidates for handoffs of a terrestrial mobile user between one or more communication beams and terrestrial cell sites based on maintaining a fixed communication beam pattern, the location and heading of the airplane, the locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data, and the locations of respective cell sites, the calculation performed for each of the one or more communication beams transmitted from the airplane;

dividing up the list of viable handoff terrestrial cell site candidates into multiple candidate groups according to candidate geographic locations within each of the one or more communication beams transmitted from the airplane; and

cycling through the multiple candidate groups to further reduce the list of viable handoff terrestrial candidates based on the multiple candidate groups.

Application No. 09/605,085

Response to Office Action of August 26, 2004

24. (New) The method of claim 23, wherein the determining of a location and heading of the airplane comprises receiving a flight pattern location of the airplane via a telemetry link.

25. (New) The method of claim 23, wherein the step of calculating a list of viable handoff terrestrial cell site candidates comprises mapping data generated from the steps of maintaining a fixed communication beam pattern, determining a location and heading of the airplane, determining locations of each of the one or more communication beams transmitted from the airplane based on airplane flight pattern data, and determining locations of respective cell sites to a cell site location database to determine the viable handoff terrestrial cell site candidates.

26. (New) The method of claim 23, further comprising ranking each of the viable handoff terrestrial cell site candidates based on associated probability data found during the calculating of a list of viable handoff terrestrial cell site candidates.

27. (New) The method of claim 26, wherein a number of the viable handoff terrestrial cell site candidates found during the calculating of a list of viable handoff terrestrial cell site candidates is protocol-dependent.

28. (New) The method of claim 23, further comprising updating the list of viable handoff terrestrial cell site candidates as a function of time as the airplane flight pattern data changes.

29. (New) The method of claim 23, wherein the calculating of a list of viable handoff terrestrial cell site candidates is performed to compensate for airplane flight pattern changes caused by adverse weather conditions.

30. (New) The method of claim 23, further comprising calculating viable airplane beams for receiving handoffs from terrestrial cell sites; and  
creating an airplane beam handoff list based on the calculating of viable airplane beams.